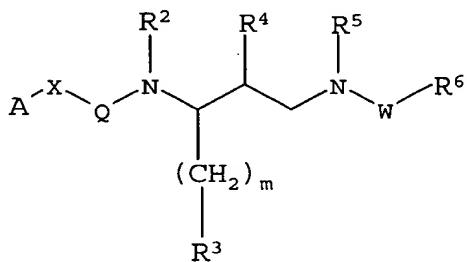


CLAIM AMENDMENTS

1-46. (Canceled)

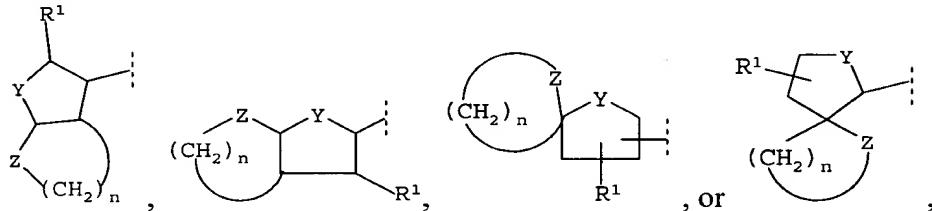
47. (Previously Presented) A method of preventing the development of drug resistance in an HIV-infected mammal, said method comprising administering to said HIV-infected mammal a drug resistance-inhibiting effective amount of a compound of the formula:



(I),

or a pharmaceutically acceptable salt, a prodrug, or an ester thereof, or a pharmaceutically acceptable composition of said compound, said salt, said prodrug, or said ester thereof, wherein:

A is a group of the formula:



R^1 is H or an alkyl, an alkenyl, an alkynyl, a cycloalkyl, a cycloalkylalkyl, an aryl, an aralkyl, a heterocycloalkyl, a heterocycloalkylalkyl, a heteroaryl, or a heteroaralkyl, in which at least one hydrogen atom is optionally substituted with a substituent selected from the group consisting of OR^7 , SR^7 , CN , NO_2 , N_3 , and a halogen, wherein R^7 is H, an unsubstituted alkyl, an unsubstituted alkenyl, or an unsubstituted alkynyl;

Y and Z are the same or different and [are independently] each is selected from the group consisting of CH_2 , O , S , SO , SO_2 , NR^8 , $\text{R}^8\text{C}(\text{O})\text{N}$, $\text{R}^8\text{C}(\text{S})\text{N}$, $\text{R}^8\text{OC}(\text{O})\text{N}$, $\text{R}^8\text{OC}(\text{S})\text{N}$, $\text{R}^8\text{SC}(\text{O})\text{N}$, $\text{R}^8\text{R}^9\text{NC}(\text{O})\text{N}$, and $\text{R}^8\text{R}^9\text{NC}(\text{S})\text{N}$, wherein R^8 and R^9 are each selected from the group consisting of H, an unsubstituted alkyl, an unsubstituted alkenyl, and an unsubstituted alkynyl;

n is an integer from 1 to 5;

X is a covalent bond, CHR^{10} , $\text{CHR}^{10}\text{CH}_2$, $\text{CH}_2\text{CHR}^{10}$, O, NR^{10} , or S, wherein R^{10} is H, an unsubstituted alkyl, an unsubstituted alkenyl, or an unsubstituted alkynyl;

Q is C(O), C(S), or SO_2 ;

R^2 is H, a $\text{C}_1\text{-C}_6$ alkyl, a $\text{C}_2\text{-C}_6$ alkenyl, or a $\text{C}_2\text{-C}_6$ alkynyl;

m is an integer from 0 to 6;

R^3 is a cycloalkyl, a heterocycloalkyl, an aryl, or a heteroaryl in which at least one hydrogen atom is optionally substituted with a substituent selected from the group consisting of alkyl, $(\text{CH}_2)_p\text{R}^{11}$, OR^{12} , SR^{12} , CN, N_3 , NO_2 , $\text{NR}^{12}\text{R}^{13}$, C(O)R^{12} , C(S)R^{12} , CO_2R^{12} , C(O)SR^{12} , $\text{C(O)NR}^{12}\text{R}^{13}$, $\text{C(S)NR}^{12}\text{R}^{13}$, $\text{NR}^{12}\text{C(O)R}^{13}$, $\text{NR}^{12}\text{C(S)R}^{13}$, $\text{NR}^{12}\text{CO}_2\text{R}^{13}$, $\text{NR}^{12}\text{C(O)SR}^{13}$, and a halogen, wherein:

p is an integer from 0 to 5;

R^{11} is a cycloalkyl, a heterocycloalkyl, an aryl, or a heteroaryl in which at least one hydrogen atom is optionally substituted with a substituent selected from the group consisting of a halogen, OH, OCH_3 , NH_2 , NO_2 , SH, and CN; and

R^{12} and R^{13} are the same or different and each is selected from the group consisting of H, an unsubstituted alkyl, an unsubstituted alkenyl, and an unsubstituted alkynyl;

R^4 is OH, =O (keto) or NH_2 , wherein, when R^4 is OH, it is optionally in the form of a pharmaceutically acceptable ester or prodrug, and when R^4 is NH_2 , it is optionally an amide, a hydroxylamino, a carbamate, a urea, an alkylamino, a dialkylamino, a protic salt thereof, or a tetraalkylammonium salt thereof;

R^5 is H, a $\text{C}_1\text{-C}_6$ alkyl radical, a $\text{C}_2\text{-C}_6$ alkenyl radical, or $(\text{CH}_2)_q\text{R}^{14}$, wherein q is an integer from 0 to 5, and R^{14} is a cycloalkyl, a heterocycloalkyl, an aryl, or a heteroaryl radical in which at least one hydrogen atom is optionally substituted with a substituent selected from the group consisting of a halogen, OH, OCH_3 , NH_2 , NO_2 , SH, and CN;

W is C(O), C(S), or SO_2 ; and

R^6 is a cycloalkyl, heterocycloalkyl, aryl, or heteroaryl radical in which at least one hydrogen atom is optionally substituted with a substituent selected from the group consisting of a halogen, OR^{15} , SR^{15} , S(O)R^{15} , SO_2R^{15} , $\text{SO}_2\text{NR}^{15}\text{R}^{16}$, $\text{SO}_2\text{N(OH)R}^{15}$, CN, $\text{CR}^{15}=\text{NR}^{16}$, $\text{CR}^{15}=\text{N(OR}^{16}\text{)}$, N_3 , NO_2 , $\text{NR}^{15}\text{R}^{16}$, N(OH)R^{15} , C(O)R^{15} , C(S)R^{15} , CO_2R^{15} , C(O)SR^{15} , $\text{C(O)NR}^{15}\text{R}^{16}$, $\text{C(S)NR}^{15}\text{R}^{16}$, C(O)N(OH)R^{15} , C(S)N(OH)R^{15} , $\text{NR}^{15}\text{C(O)R}^{16}$, $\text{NR}^{15}\text{C(S)R}^{16}$, N(OH)C(O)R^{15} , N(OH)C(S)R^{15} , $\text{NR}^{15}\text{CO}_2\text{R}^{16}$, $\text{N(OH)CO}_2\text{R}^{15}$, $\text{NR}^{15}\text{C(O)SR}^{16}$, $\text{NR}^{15}\text{C(O)NR}^{16}\text{R}^{17}$, $\text{NR}^{15}\text{C(S)NR}^{16}\text{R}^{17}$, $\text{N(OH)C(O)NR}^{15}\text{R}^{16}$, $\text{N(OH)C(S)NR}^{15}\text{R}^{16}$, $\text{NR}^{15}\text{C(O)N(OH)R}^{16}$, $\text{NR}^{15}\text{C(S)N(OH)R}^{16}$, $\text{NR}^{15}\text{SO}_2\text{R}^{16}$, $\text{NHSO}_2\text{NR}^{15}\text{R}^{16}$, $\text{NR}^{15}\text{SO}_2\text{NHR}^{16}$, $\text{P(O)(OR}^{15}\text{)(OR}^{16}\text{)}$, an alkyl, an alkoxy, an alkylthio, an alkylamino, a cycloalkyl, a

cycloalkylalkyl, a heterocycloalkyl, a heterocycloalkylalkyl, an aryl, an aryloxy, an arylamino, an arylthio, an aralkyl, an aryloxyalkyl, an arylaminoalkyl, an aralkoxy, an (aryloxy)alkoxy, an (aryl amino)alkoxy, an (arylthio)alkoxy, an aralkylamino, an (aryloxy)alkylamino, an (aryl amino)alkylamino, an (arylthio)alkylamino, an aralkylthio, an (aryloxy)alkylthio, an (aryl amino)alkylthio, an (arylthio)alkylthio, a heteroaryl, a heteroaryloxy, a heteroaryl amino, a heteroarylthio, a heteroaralkyl, a heteroaralkoxy, a heteroaralkylamino, and a heteroaralkylthio,

wherein R^{15} , R^{16} , and R^{17} are the same or different and each is H, an unsubstituted alkyl, or an unsubstituted alkenyl,

wherein, when at least one hydrogen atom of R^6 is substituted with a substituent other than a halogen, OR^{15} , SR^{15} , CN , N_3 , NO_2 , $NR^{15}R^{16}$, $C(O)R^{15}$, $C(S)R^{15}$, CO_2R^{15} , $C(O)SR^{15}$, $C(O)NR^{15}R^{16}$, $C(S)NR^{15}R^{16}$, $NR^{15}C(O)R^{16}$, $NR^{15}C(S)R^{16}$, $NR^{15}CO_2R^{16}$, $NR^{15}C(O)SR^{16}$, $NR^{15}C(O)NR^{16}R^{17}$, or $NR^{15}C(S)NR^{16}R^{17}$, at least one hydrogen atom on said substituent is optionally substituted with a halogen, OR^{15} , SR^{15} , CN , N_3 , NO_2 , $NR^{15}R^{16}$, $C(O)R^{15}$, $C(S)R^{15}$, CO_2R^{15} , $C(O)SR^{15}$, $C(O)NR^{15}R^{16}$, $C(S)NR^{15}R^{16}$, $NR^{15}C(O)R^{15}$, $NR^{15}C(S)R^{16}$, $NR^{15}CO_2R^{16}$, $NR^{15}C(O)SR^{16}$, $NR^{15}C(O)NR^{16}R^{17}$, or $NR^{15}C(S)NR^{16}R^{17}$; and

wherein a mutant virus that is capable of evolving from the HIV virus infecting said mammal has lower fitness, relative to said HIV virus infecting said mammal, in the presence of said compound.

48. (Canceled)

49. (Previously Presented) The method of claim 47, wherein:

when R^1 is an alkyl, it is a C_1 - C_6 alkyl;

when R^1 is an alkenyl it is a C_2 - C_6 alkenyl;

when R^1 is a cycloalkyl, a heterocycloalkyl, an aryl, or a heteroaryl, R^1 is a 4-7 membered ring;

when R^7 , R^8 or R^9 is an unsubstituted alkyl, it is a C_1 - C_6 unsubstituted alkyl;

when R^7 , R^8 or R^9 is an unsubstituted alkenyl, it is a C_2 - C_6 unsubstituted alkenyl;

R^3 is a 4-7 membered ring;

R^{11} is a 4-7 membered ring;

when R^{12} or R^{13} is an unsubstituted alkyl, it is a C_1 - C_6 unsubstituted alkyl;

when R^{12} or R^{13} is an unsubstituted alkenyl, it is a C_2 - C_6 unsubstituted alkyl;

when R^{14} is a cycloalkyl, a heterocycloalkyl, an aryl, or a heteroaryl, R^{14} is a 4-7 membered ring;

when R^6 is a cycloalkyl, a heterocycloalkyl, aryl, or a heteroaryl, R^6 is a 4-7 membered ring;

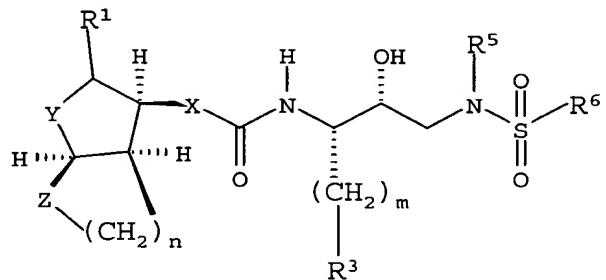
when R^6 is substituted with a substituent that is an alkyl, an alkylthio, or an alkylamino, the substituent comprises from one to six carbon atoms; and

when R^6 is substituted with a substituent that is a cycloalkyl, a heterocycloalkyl, an aryl, or a heteroaryl, the substituent is a 4-7 membered ring;

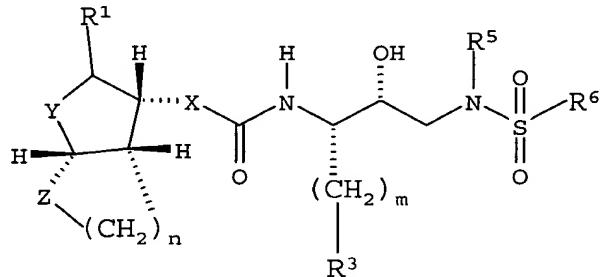
or a pharmaceutically acceptable salt, a prodrug, or an ester thereof.

50. (Previously Presented) The method of claim 47, wherein Q is C(O), R^2 is H, and W is SO₂, or a pharmaceutically acceptable salt, a prodrug, or an ester thereof.

51. (Previously Presented) The method of claim 47, wherein said compound is represented by the formula:

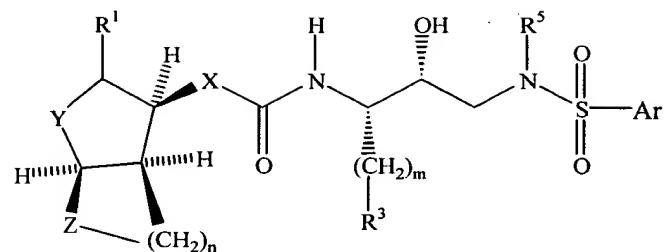


(IA) or

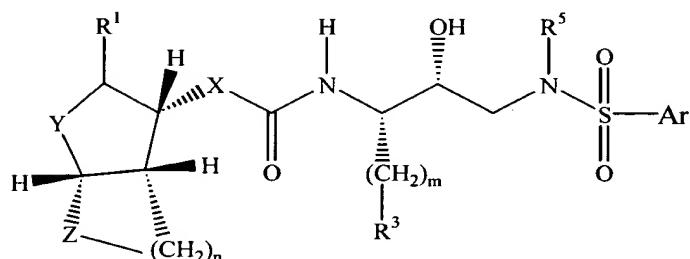


(IB).

52. (Original) The method of claim 51, wherein said compound is represented by the formula:



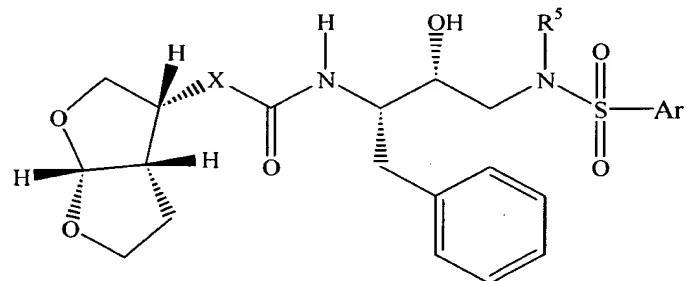
(IC) or



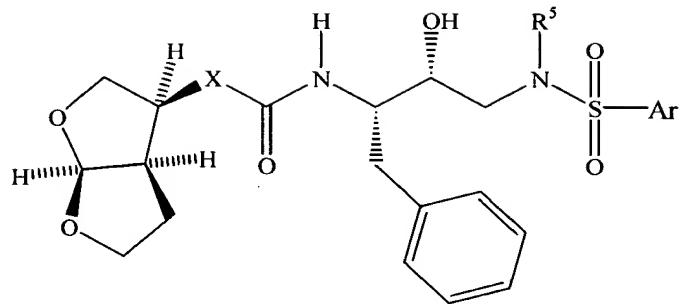
(ID),

wherein Ar is a phenyl which is optionally substituted with a substituent selected from the group consisting of methyl, amino, hydroxy, methoxy, methylthio, hydroxymethyl, aminomethyl, and methoxymethyl.

53. (Original) The method of claim 52, wherein said compound is represented by the formula:



(IE) or

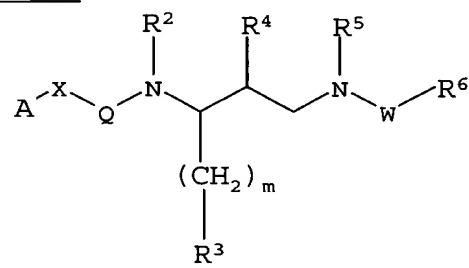


(IF).

54. (Previously Presented) The method of claim 52, wherein X is oxygen.
55. (Previously Presented) The method of claim 52, wherein R⁵ is isobutyl.
56. (Previously Presented) The method of claim 52, wherein Ar is a phenyl substituted at the para-position.
57. (Previously Presented) The method of claim 52, wherein Ar is a phenyl substituted at the meta-position.
58. (Previously Presented) The method of claim 52, wherein Ar is a phenyl substituted at the ortho-position.
59. (Previously Presented) The method of claim 52, wherein Ar is selected from the group consisting of para-aminophenyl, para-tolyl, para-methoxyphenyl, meta-methoxyphenyl, and meta-hydroxymethylphenyl.
60. (Previously Presented) The method of claim 47, wherein said HIV-infected mammal is infected with a wild-type HIV.
61. (Previously Presented) The method of claim 47, wherein said HIV-infected mammal is infected by a mutant HIV with least one protease mutation.

62. (Previously Presented) The method of claim 47, wherein said HIV-infected mammal is infected by a mutant HIV having at least one reverse transcriptase mutation.

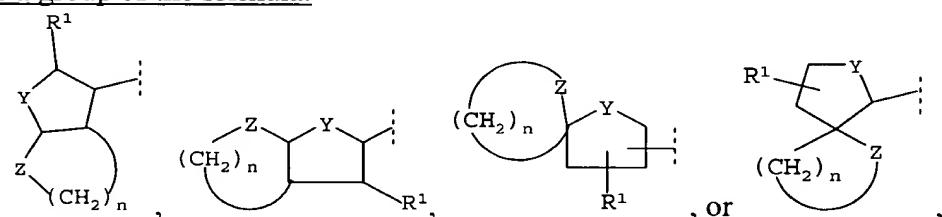
63. (Currently Amended) A method of treating a mutant retroviral infection in a mammal infected with a mutant retrovirus, which method comprises administering to said mammal a mutant retroviral-inhibiting effective amount of a compound or composition defined in claim 47 of the formula:



(I),

or a pharmaceutically acceptable salt, a prodrug, or an ester thereof, or a pharmaceutically acceptable composition of said compound, said salt, said prodrug, or said ester thereof, wherein:

A is a group of the formula:



R¹ is H or an alkyl, an alkenyl, an alkynyl, a cycloalkyl, a cycloalkylalkyl, an aryl, an aralkyl, a heterocycloalkyl, a heterocycloalkylalkyl, a heteroaryl, or a heteroaralkyl, in which at least one hydrogen atom is optionally substituted with a substituent selected from the group consisting of OR⁷, SR⁷, CN, NO₂, N₃, and a halogen, wherein R⁷ is H, an unsubstituted alkyl, an unsubstituted alkenyl, or an unsubstituted alkynyl;

Y and Z are the same or different and [are independently] each is selected from the group consisting of CH₂, O, S, SO, SO₂, NR⁸, R⁸C(O)N, R⁸C(S)N, R⁸OC(O)N, R⁸OC(S)N, R⁸SC(O)N, R⁸R⁹NC(O)N, and R⁸R⁹NC(S)N, wherein R⁸ and R⁹ are each selected from the group consisting of H, an unsubstituted alkyl, an unsubstituted alkenyl, and an unsubstituted alkynyl;

n is an integer from 1 to 5;

X is a covalent bond, CHR^{10} , $\text{CHR}^{10}\text{CH}_2$, $\text{CH}_2\text{CHR}^{10}$, O, NR^{10} , or S, wherein R^{10} is H, an unsubstituted alkyl, an unsubstituted alkenyl, or an unsubstituted alkynyl;

Q is C(O), C(S), or SO_2 ;

R^2 is H, a $\text{C}_1\text{-C}_6$ alkyl, a $\text{C}_2\text{-C}_6$ alkenyl, or a $\text{C}_2\text{-C}_6$ alkynyl;

m is an integer from 0 to 6;

R^3 is a cycloalkyl, a heterocycloalkyl, an aryl, or a heteroaryl in which at least one hydrogen atom is optionally substituted with a substituent selected from the group consisting of alkyl, $(\text{CH}_2)_p\text{R}^{11}$, OR¹², SR¹², CN, N₃, NO₂, NR¹²R¹³, C(O)R¹², C(S)R¹², CO₂R¹², C(O)SR¹², C(O)NR¹²R¹³, C(S)NR¹²R¹³, NR¹²C(O)R¹³, NR¹²C(S)R¹³, NR¹²CO₂R¹³, NR¹²C(O)SR¹³, and a halogen, wherein:

p is an integer from 0 to 5;

R^{11} is a cycloalkyl, a heterocycloalkyl, an aryl, or a heteroaryl in which at least one hydrogen atom is optionally substituted with a substituent selected from the group consisting of a halogen, OH, OCH₃, NH₂, NO₂, SH, and CN; and

R^{12} and R^{13} are the same or different and each is selected from the group consisting of H, an unsubstituted alkyl, an unsubstituted alkenyl, and an unsubstituted alkynyl;

R^4 is OH, =O (keto) or NH₂, wherein, when R^4 is OH, it is optionally in the form of a pharmaceutically acceptable ester or prodrug, and when R^4 is NH₂, it is optionally an amide, a hydroxylamino, a carbamate, a urea, an alkylamino, a dialkylamino, a protic salt thereof, or a tetraalkylammonium salt thereof;

R^5 is H, a $\text{C}_1\text{-C}_6$ alkyl radical, a $\text{C}_2\text{-C}_6$ alkenyl radical, or $(\text{CH}_2)_q\text{R}^{14}$, wherein q is an integer from 0 to 5, and R^{14} is a cycloalkyl, a heterocycloalkyl, an aryl, or a heteroaryl radical in which at least one hydrogen atom is optionally substituted with a substituent selected from the group consisting of a halogen, OH, OCH₃, NH₂, NO₂, SH, and CN;

W is C(O), C(S), or SO_2 ; and

R^6 is a cycloalkyl, heterocycloalkyl, aryl, or heteroaryl radical in which at least one hydrogen atom is optionally substituted with a substituent selected from the group consisting of a halogen, OR¹⁵, SR¹⁵, S(O)R¹⁵, SO₂R¹⁵, SO₂NR¹⁵R¹⁶, SO₂N(OH)R¹⁵, CN, CR¹⁵=NR¹⁶, CR¹⁵=N(OR¹⁶), N₃, NO₂, NR¹⁵R¹⁶, N(OH)R¹⁵, C(O)R¹⁵, C(S)R¹⁵, CO₂R¹⁵, C(O)SR¹⁵, C(O)NR¹⁵R¹⁶, C(S)NR¹⁵R¹⁶, C(O)N(OH)R¹⁵, C(S)N(OH)R¹⁵, NR¹⁵C(O)R¹⁶, NR¹⁵C(S)R¹⁶, N(OH)C(O)R¹⁵, N(OH)C(S)R¹⁵, NR¹⁵CO₂R¹⁶, N(OH)CO₂R¹⁵, NR¹⁵C(O)SR¹⁶, NR¹⁵C(O)NR¹⁶R¹⁷, NR¹⁵C(S)NR¹⁶R¹⁷, N(OH)C(O)NR¹⁵R¹⁶, N(OH)C(S)NR¹⁵R¹⁶, NR¹⁵C(O)N(OH)R¹⁶, NR¹⁵C(S)N(OH)R¹⁶, NR¹⁵SO₂R¹⁶, NHSO₂NR¹⁵R¹⁶, NR¹⁵SO₂NHR¹⁶, P(O)(OR¹⁵)(OR¹⁶), an alkyl, an alkoxy, an alkylthio, an alkylamino, a cycloalkyl, a

cycloalkylalkyl, a heterocycloalkyl, a heterocycloalkylalkyl, an aryl, an aryloxy, an arylamino, an arylthio, an aralkyl, an aryloxyalkyl, an arylaminoalkyl, an aralkoxy, an (aryloxy)alkoxy, an (aryl amino)alkoxy, an (arylthio)alkoxy, an aralkylamino, an (aryloxy)alkylamino, an (aryl amino)alkylamino, an (arylthio)alkylamino, an aralkylthio, an (aryloxy)alkylthio, an (aryl amino)alkylthio, an (arylthio)alkylthio, a heteroaryl, a heteroaryloxy, a heteroaryl amino, a heteroarylthio, a heteroaralkyl, a heteroaralkoxy, a heteroaralkylamino, and a heteroaralkylthio,

wherein R¹⁵, R¹⁶, and R¹⁷ are the same or different and each is H, an unsubstituted alkyl, or an unsubstituted alkenyl,

wherein, when at least one hydrogen atom of R⁶ is substituted with a substituent other than a halogen, OR¹⁵, SR¹⁵, CN, N₃, NO₂, NR¹⁵R¹⁶, C(O)R¹⁵, C(S)R¹⁵, CO₂R¹⁵, C(O)SR¹⁵, C(O)NR¹⁵R¹⁶, C(S)NR¹⁵R¹⁶, NR¹⁵C(O)R¹⁶, NR¹⁵C(S)R¹⁶, NR¹⁵CO₂R¹⁶, NR¹⁵C(O)SR¹⁶, NR¹⁵C(O)NR¹⁶R¹⁷, or NR¹⁵C(S)NR¹⁶R¹⁷, at least one hydrogen atom on said substituent is optionally substituted with a halogen, OR¹⁵, SR¹⁵, CN, N₃, NO₂, NR¹⁵R¹⁶, C(O)R¹⁵, C(S)R¹⁵, CO₂R¹⁵, C(O)SR¹⁵, C(O)NR¹⁵R¹⁶, C(S)NR¹⁵R¹⁶, NR¹⁵C(O)R¹⁵, NR¹⁵C(S)R¹⁶, NR¹⁵CO₂R¹⁶, NR¹⁵C(O)SR¹⁶, NR¹⁵C(O)NR¹⁶R¹⁷, or NR¹⁵C(S)NR¹⁶R¹⁷; and

wherein a mutant virus that is capable of evolving from the HIV virus infecting said mammal has lower fitness, relative to said HIV virus infecting said mammal, in the presence of said compound.

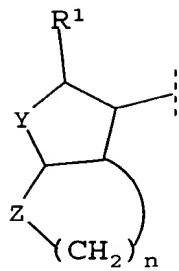
64. (Previously Presented) The method of claim 63, wherein said mutant retrovirus is a multidrug-resistant mutant retrovirus.

65. (Previously Presented) The method of claim 63, wherein said mutant retrovirus is a multidrug-resistant HIV.

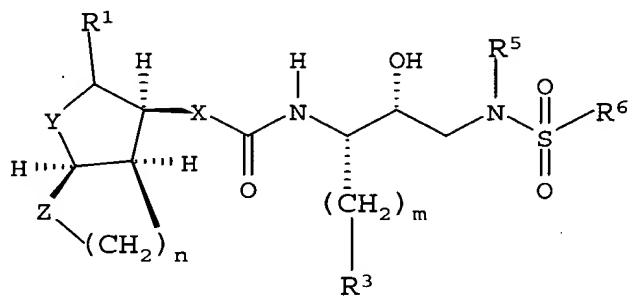
66. (Previously Presented) The method of claim 63, wherein said mutant retrovirus is a multidrug-resistant HIV-1.

67. (New) The method of claim 63, wherein the mutant retrovirus is resistant to at least one antiviral agent selected from the group consisting of ritonavir, indinavir, amprenavir and saquinavir.

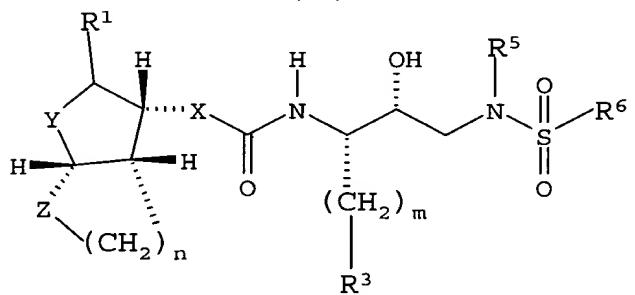
68. (New) The method of claim 63, wherein A is a group of the formula:



69. (New) The method of claim 63, wherein the compound is of the formula:

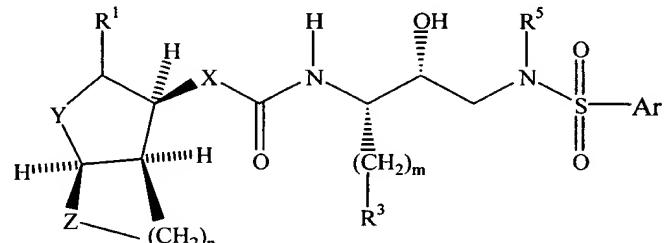


(IA) or

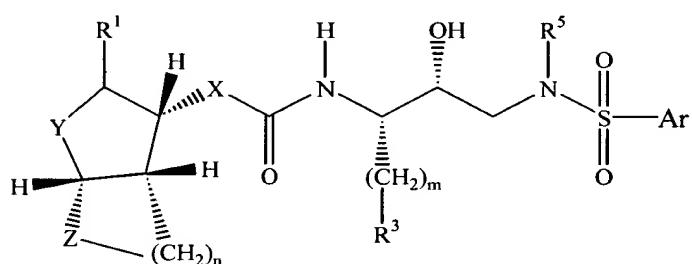


(IB).

70. (New) The method of claim 63, wherein the compound is of the formula:

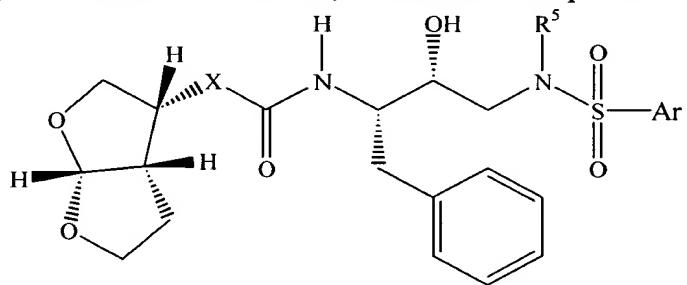


or

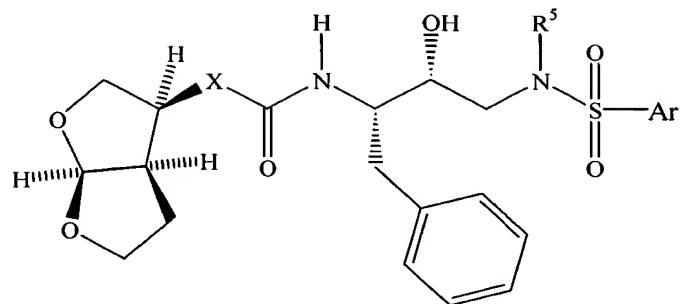


wherein Ar is a phenyl, which is unsubstituted or substituted with one or more substituents selected from the group consisting of methyl, amino, hydroxy, methoxy, methylthio, hydroxymethyl, aminomethyl, and methoxymethyl.

71. (New) The method of claim 63, wherein the compound is of the formula:



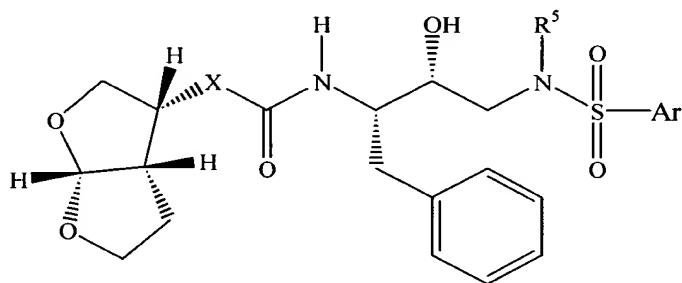
or



(IF),

wherein Ar is a phenyl, which is unsubstituted or substituted with one or more substituents selected from the group consisting of methyl, amino, hydroxy, methoxy, methylthio, hydroxymethyl, aminomethyl, and methoxymethyl.

72. (New) The method of claim 71, wherein the compound is of the formula:



(IE).

73. (New) The method of claim 72, wherein R^5 is isobutyl.

74. (New) The method of claim 73, wherein Ar is a phenyl substituted at the para-position.

75. (New) The method of claim 73, wherein Ar is selected from the group consisting of *p*-aminophenyl, *p*-methoxyphenyl and *p*-tolyl.

76. (New) The method of claim 73, wherein Ar is *p*-aminophenyl.

77. (New) The method of claim 73, wherein Ar is *p*-methoxyphenyl.

78. (New) The method of claim 73, wherein the mutant retrovirus is resistant to at least one antiviral agent selected from the group consisting of ritonavir, indinavir, amprenavir and saquinavir.